Technical Capability Statement

- Discuss experience providing broadband.

  Hartington Telecommunications Co., Inc. (Hartelco) has been offering broadband services since 1995. Hartelco started off with Dial Up Internet Access in 1995, DSL Internet Access in 1999, Fiber to the node-Rural in 2006, Fiber to the home in the town of Hartington, NE in 2009, and 2013 Fiber to the home in the Rural areas of their Hartington ILEC exchange. Hartelco offers its customers voice, video, and broadband internet services (Triple Play). Hartelco currently offers broadband services to approximately 1,093 subscribers. Hartelco has been Gig-Capable Certified with NTCA since June of 2017.

  Hartelco has completed the 2021 Nebraska Broadband Bridge Program Grant Project NorthStar that it received in January 2022. The company has connected eighty customers to advanced telecommunication services through the installation of fiber to their home.

  Hartelco is in the process of completing the Capital Project Fund Program Grant projects Fordyce and St. Helena that it received in June 2023. The company has begun construction in Fordyce to bring eighty-three locations advanced telecommunication services through the installation of fiber to their home. This spring, Hartelco will complete the installation of fiber in Fordyce and begin construction in St. Helena for forty-two locations.

  Also, Hartelco received four 2023 Nebraska Broadband Bridge Program grants in January 2023. The grants will provide advanced telecommunications services to 540 unserved locations in Cedar and Knox counties in Nebraska.

  Based on our technical capability described in subsequent paragraphs, and our long history in the telecommunications industry, Hartelco has the technical capability to meet the statutory technical and speed requirements in place throughout the fifteen-year period.

- Does provider currently provide broadband at a minimum of 100/100?

  The applicant currently provides broadband at a minimum of 100/100 Mbps as indicated in Attachment Letter C.

- How will the project be resilient and sustainable in the long-term?

  By using industry standard equipment that is furnished by a long-term equipment supplier. The design and layout of the network is done in such a way as to make access to the equipment easy and safe. The design of the CO and cabinets allows space for additional equipment as the demand increases. The outside plant places extra fiber at key locations to allow for growth.

  The technology being used will be a combination of Active Ethernet and XGS-PON. Both technologies have the capability of providing 1 Gbps service to subscribers. The Active Ethernet is a dedicated connection between the OLT, located in the CO and the ONT located subscriber. The XGS-PON is a shared 10 Gbps connection that is shared between the number of subscribers sharing a single fiber. The XGS-PON is designed to be backwards compatible with GPON optics.

The XGS-PON optics are also capable of transmitting either GPON or XGS-PON without the requirement for additional equipment.

The network is being designed using a combination of active and passive optical components. The network will pass 117 locations and use approximately 99,485 feet of optical fiber. The optical fiber in town will be installed using directional boring and the rural transport fiber will be direct buried. The active equipment being used has high reliability and may only need to be accessed once a year or during software updates. For the passive components, such as a splitter, splice cases and optical fiber, these will only need to be accessed in cases of physical damage to these components. This would include fiber cuts and damage to a pedestal or handhole. This type of damage is hard to predict. To minimize damage to the outside plant, warning signage is used to mark the fiber path. The placement of a locate pedestals and handholes are done to minimize the possibility of damage.

- Discuss the number of technical staff that will be dedicated to serving the project area once the project is complete. Provide any other relevant technical expertise/ability of the applicant's staff.

  Hartelco currently has four (4) Central office equipment (COE)/Outside Plant (OSP) employees and three (3) computer technicians. Hartelco currently uses their own staff to operate and maintain their FTTH system. Hartelco will use their staff to operate and maintain the FTTH facilities deployed as part of the Kohles Acres Project.

- Provide a description of how the service area will be maintained throughout the useful life of the facilities.

  Hartelco uses our current staff to maintain network infrastructure using common industry practices for each of the services provided. The network and services will be monitored and supported 24x7x365 by Hartelco's technical and customer service staff. The applicant will leverage existing staff and processes to operate the proposed network deployment. Troubleshooting and service provisioning will be handled by applicant office staff using a combination of existing automated systems. Orders for services will be taken by our customer service representatives. Equipment will be provisioned by our office technicians and professional installation will be completed by our outside plant technicians. In addition, Hartelco maintains service contracts with key vendors, contractors, and professional service firms if additional assistance is required. Hartelco currently complies with and successfully fulfills CAF BLS speed testing requirements.

- Identify the expected useful life of the facilities proposed to be built with the NBBP funding. The description should include a statement as to the technological components used and if applicable, which components may require more frequent repair or replacement.

<u>The technical components used and the expected useful life of the facilities.</u>

	RUS Estimate	Engineer Estimate
Buried fiber	20 years	25-50 years.
Electronics equipment	10.67 years	10-15 years
ONTS	5-10 years	7-10 years

<u>Components which may require more frequent repair:</u>

The most frequently repaired/replaced items in a FTTH network will be at the customer premise. These items could include power supply/battery backup, ONT and premise wiring.

- Describe their technical capability to meet the requirement to provide a minimum 100/100 Mbps in all locations that receive grant funding, and their plans to meet the minimum statutory technical and speed requirements in place for the NBBP throughout the fifteen-year period.

  Hartelco currently uses 10GE Active Ethernet (IEEE 802.3ae standard) and 1GE Active Ethernet (802.3ah standard) and NG-PON, using GPON (ITU G.984) and XGS-PON (ITTU-T G.9807.1 standard) fiber-to-the-premises (FTTP) for their last-mile technology to supply services to their customers. As a single exchange ILEC, Hartelco has no middle-mile/backhaul network. Interconnections are handled separately for voice and data. For voice, Hartelco utilizes a Ribbon C15 Class 5 switch connected to the Public Switched Telephone Network (PSTN) via CenturyLink toll center in Norfolk, Nebraska using a connection with Optical Network and with Inteliquent via redundant SIP trunks. For Broadband, Hartelco has two optical ethernet connections utilizing Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) to uplink to a Tier 2 broadband provider. The total capacity of these optical connections is 4.3 Gbps.

  For the middle mile network, Hartelco utilizes the DZS NMS (DZS CONNECT-ACS-1K) to monitor individual customer usage and if peak usage frequently exceeds 75% on a 15-minute average, Hartelco will be capable of upgrading their last mile service to 10Gbps Active Ethernet should the customer choose to upgrade their service beyond 1Gpbs.

  For the middle mile network, Hartelco utilizes the DZS NMS (DZS CONNECT-ACS-1K) to monitor every optical ethernet link and if peak average utilization over a 5-minute average exceeds 75%, the system being proposed is capable of adding a second 10 Gbps of bandwidth via IEEE 802.1ax (formerly IEEE 802.3ad) Link Aggregation Control Protocol (LACP) to effectively double the bandwidth of that link.

- Does the applicant's website clearly state that the applicant offers services that meet the 100/100 or greater speed minimum?

  As demonstrated in Attachment C_1, Hartelco's website clearly states that it offers 100/100 or greater speeds.